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Publishing data and modelling research objects

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Editorial

A journal by modellers, for modellers: Introducing Agricultural and Environmental Modelling

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Abstract

Modelling is central to modern agricultural, ecological and environmental science. From agent-based simulations of pollinator populations to coupled food-system models informing policy, the computational and mathematical work of modellers underpins some of the most consequential scientific outputs of our time. Yet the publishing landscape has consistently struggled to give that work its due. Formal model descriptions, calibration studies, implementation documentation and software workflows have rarely found a natural home in traditional journals. Too often, the foundational work that makes applied modelling possible goes uncited, unreviewed and unrewarded.

Agricultural and Environmental Modelling (AEM) exists to change that. Through several iterations, this journal is the evolution of the Food and Ecological Systems Modelling Journal (FESMJ) and its earliest predecessor: the Food Modelling Journal (FMJ). AEM has now broadened in scope, deepened in Open Science ambition and redesigned around the full lifecycle of modelling research.

Key words: Agricultural modelling, ARPHA, ecological modelling, environmental modelling, modelling lifecycle, open science, scholarly publishing

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Publishing the full modelling lifecycle

Modern modelling research is data-centric, collaborative and iterative. A complex model is not born in a single paper: it emerges through cycles of formal specification, software implementation, calibration, testing and application, often carried out by different teams across different project phases. Each of those steps represents genuine scientific work; each deserves recognition.

There is a need for better recognition for collaborative labour. New research in contemporary environment and social science research highlights the concept of "invisible labour", where required hidden efforts that underpin a modelling project's success remain largely overlooked and go unrewarded in academia (Yáñez et al. 2026). There is also citation bias, where researchers often use a model's foundational influence, but cite their own prior implementations of a model. As a result, the foundational reasoning and assumptions defin-

ing a model's parameters remain uncited (MacRoberts et al. 2010). As modelling research grows in complexity, the underlying assumptions and reasoning become "black boxes" that are rarely scrutinised by policy-makers and stakeholders, leading to a lack of transparency in the modelling research lifecycle (Maeda et al. 2021).

A journal built by modellers, for modellers: because every step in the modelling lifecycle deserves a citation.
AEM Editorial Vision

The Agricultural and Environmental Modelling journal (AEM) was built around this reality. The journal offers new publishing formats in its commitment to the FAIR principles (Findability, Accessibility, Interoperability and Reusability; Wilkinson et al. 2016) applied to diverse scholarly research outputs. To this end, AEM goes beyond the dissemination of narrative and data to also incorporate models and code into its peer-reviewed content. In doing so, the journal is equipped with the tools to draw a complete picture of how modelling work is conceptualised, planned and executed every step along the way.

At AEM, our goal is to increase transparency in modelling research by making the various modelling research objects citable, discoverable and reusable. Thus, it gives credit to each group of authors, at every stage of a model's development, by publishing unique article types, such as Formal Model, Model Testing and Calibration, Model Implementation and Documentation. This allows researchers to cite and acknowledge those involved in the foundational work, including the assumptions and reasoning that established a model's parameters and implementation.

We are also committed to transparency and reproducibility. All data, source code underlying published work must be made openly available under an Open Source Initiative (OSI)-approved licence. Computational workflows should be registered in WorkflowHub.eu. Machine-learning-based methods must comply with the DOME-ML guidelines for reproducibility and open benchmarking (DOME-ML 2025; Attafi et al. 2024), which some journals have already successfully implemented in their publishing process (Edmunds et al. 2026). Machine-learning models should be reproducible and presented in an easily deployable, containerised format, such as Code Ocean or Jupyter Notebook. Mandatory requirements for publication in AEM also include the addition of provenance and versions of code archived and cited as per the Software Citation Principles (Stall et al. 2023).

In an era currently being reshaped by the dominance of Artificial Intelligence (AI), academic publishing must evolve to keep pace with the integrity challenges that AI presents. Pensoft addresses this challenge by establishing transparency standards through its ARPHA Publishing Platform. On submission, authors are now required to declare use of Large Language Models (LLMs) within manuscripts, to ensure accountability. In parallel, Pensoft is optimising the peer review process, with the ARPHA platform harnessing the power of AI to identify potential high-quality peer reviewers.

AEM inherits the legacy and a proven record of innovation of the preceding titles: FESMJ and FMJ, including a "living article" experimental publication (Filter et al. 2019, see also blog post). An important part of the evolution process was the publication of the "Formal model" articles (Topping et al. 2022; Thomsen et al. 2024; Ziółkowska et al. 2025; Singer et al. 2026 and others). It is important to note that the journal has already gained a reputation within scientific circles and across bibliographic platforms. It is archived in four databases (CLOCKSS, Zenodo, Portico, and Zendy) and indexed in over 40 services, including AGRICOLA, CABI, ChronosHub, CNKI, FAO AGRIS, ResearchGate and Swisscovery, amongst others.

Scope and aims

AEM is an innovative, open-access journal dedicated to advancing the science and practice of modelling across Agriculture, Food Systems, Natural Resources and Environmental Sciences. The journal accepts submissions spanning the full breadth of these domains, including, but not limited to:

- Agriculture: management systems, production dynamics and agroecological modelling;
- Food Systems: food safety, production, quality, resilience and supply-chain control;
- Ecological Systems: ecological processes, species ecology, impact assessment and environmental risk analysis;
- Bioeconomy: modelling of biotechnology, biomass utilisation and bio-based production;
- Social-Ecological Systems: coupled human-environment interactions and governance;
- Environmental Science and Natural Resource Management.

Submissions may describe model development, methodological innovation, application of models to substantive research questions, validation and benchmarking studies or reproducible computational workflows that advance understanding or decision-making in coupled human-environment systems.

Article types

AEM publishes across the full modelling research lifecycle through a structured portfolio of article types. These range from the Formal Model – providing citable recognition for foundational mathematical and conceptual design – through Model Testing and Calibration and Model Implementation and Documentation, to standard Research Article, Review Article, Software Description, Data Paper and Short Communication. A Modelling Methods article type accommodates standalone combined descriptions for smaller models.

Full descriptions and submission templates for each article type are available in the journal's Author Guidelines.

Community and audiences

AEM is written for and by the modelling community. Our primary audiences are:

- Academic researchers developing or applying computational and mathematical models in the agricultural, (socio-)ecological, food and environmental sciences;
- Regulatory and applied scientists using models in environmental risk assessment, food safety evaluation and ecosystem management;
- Software developers and data engineers who produce the tools and workflows on which modelling science depends;
- Funding agencies and policy bodies requiring formal, peer-reviewed documentation of model foundations;
- Interdisciplinary teams working across the natural sciences, social sciences, computer science and agronomy.

As distributed teams across different project stages frequently produce modelling research, AEM enables appropriate attribution and citation of contributions from model developers, data providers, software engineers and analysts. To further recognise individual contributions within large collaborative projects, AEM integrates the Contributor Role Taxonomy (CRediT) in its submission interface and subsequent published content.

To support worldwide visibility and outreach, while prompting continuous discussion and engagement, the journal and Pensoft utilise a range of social media platforms to promote content published in AEM. Currently, AEM maintains its own pages on BlueSky, Facebook and Linkedin, as well as ResearchGate. Pensoft shares highlights and news from its entire journal portfolio on BlueSky, Facebook, Instagram, Linkedin, TikTok and Weibo. Authors in AEM are also invited to work with Pensoft's in-house Science Communication team on press releases, guest blog posts, video content and custom social media publications, in order to promote their work to wider audiences, including mass media users, amateur scientists and researchers from other academic fields. Then, authors can monitor real-time usage of their publications via the rich Metrics functionality available on each article's webpage. There, anyone can explore online mentions and citations of the article, as well as view counts for the article across different formats (HTML, PDF and XML), in addition to usage statistics for individual components, such as figures and tables.

Regular journal readers can also use the form from the journal's website homepage to sign up for the journal newsletter and receive custom notifications about new articles and relevant news. To further support two-way interaction within the modelling community, AEM also allows for users to submit news they find relevant for the journal's audience. Pending moderation, the news is made public in the News section on the journal's website and also added to the journal newsletter.

An invitation

The relaunch of the journal as Agricultural and Environmental Modelling marks both an evolution and a commitment. We retain the founding mission of FESMJ and FMJ to make modelling outputs publishable, findable and reusable and

we extend it. To this end, we have broadened the scope to match where the science is going. We have introduced article types that reflect how modelling research is actually done. We have also built in the standards for open code, open data and FAIR compliance that the field now demands.

We invite submissions from across all disciplines within our scope and encourage modellers to contact the editors to begin a conversation about specific needs in promoting sharing, use and reuse. We also welcome editor applications from experts from around the globe who share AEM's vision and values and are willing to actively contribute to this unique journal and its community. Whether you are describing a formal mathematical framework for the first time, documenting the calibration of a long-standing model, sharing data or presenting a new computational workflow that others can build upon, AEM is the place to put that work on the record.

Credit, where credit is due, is the founding principle of this journal.

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Additional information

Conflict of interest

The authors have declared that no competing interests exist.

Ethical statement

No ethical statement was reported.

Artificial Intelligence (AI) use

The authors accept full responsibility for the content of the manuscript, including the disclosure of any use of AI.
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Data availability

All of the data that support the findings of this study are available in the main text.